21st Century Skills in University and Primary Education Curricula in the Czech Republic

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Abstract

This review study concerns and presents the basic skills (needed) for the 21st Century, and the possibilities for their implementation into the current education concept of the Czech Republic. The content analysis of the basic curricula documentation part will focus on models that affect the concept of teaching in primary schools as well as how the current situation reflects concepts relating to the professional education of teachers.

Key words: 21st Century skills, educational policy, quality of education, lifelong learning, self-regulated learning, primary school, teacher education.

Introduction

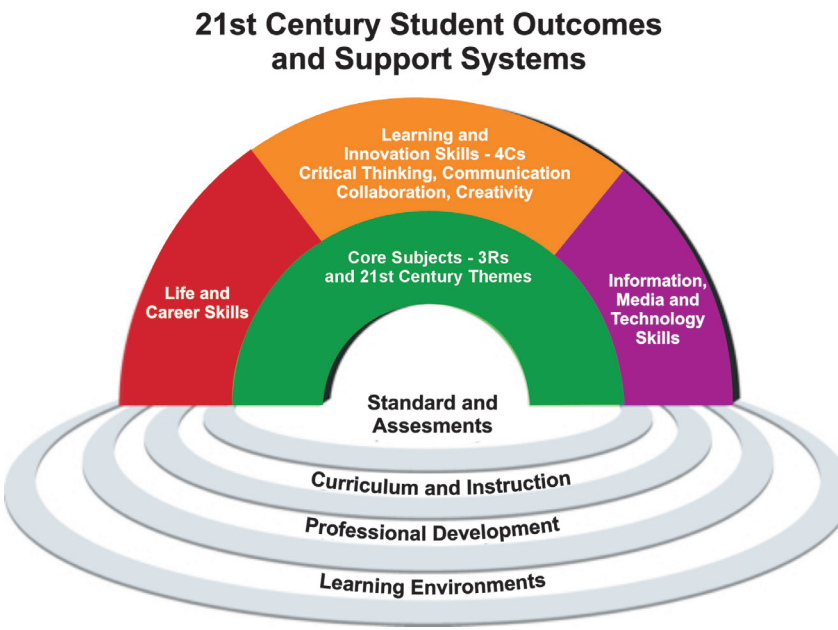
Discussions about the skills that people should be equipped with so that they can respond to changes in modern society, have been gaining in intensity recently. These have to do with the need to equip individuals with such skills so that they can respond adequately to the demands of real life. The basic requirement is to redefine educational goals (c. f., Neumajer, 2014), so as to innovate teaching methods and exploit modern educational resources and … in this direction, to provide adequate training to teach-

ers – not only in undergraduate professional training, but also in the lifelong learning context.

1 Theoretical background

The notion of 21st Century skills can be defined from different perspectives. Basic information is provided – for example by, groups / activities / or the "Partnership for 21st Century Skills (P21)" organization (Fig. 1). Several categories include teaching skills of an innovative nature, life and career skills, or information, media and technology skills that are reflected in the education process – and this applies in terms of the quality of educational standards and curriculum, as well as in the development of training and learning environments as a whole.

Figure 1
P21's Framework for 21st Century Learning



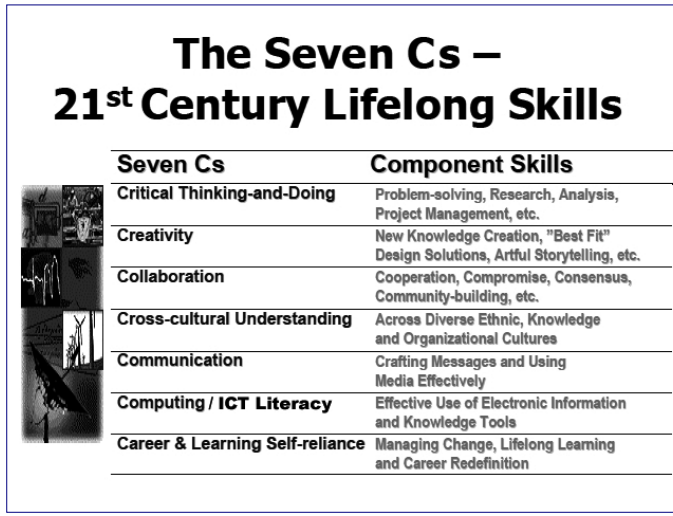
(Retrieved from http://www.p21.org/our-work/p21-framework)

A list of 21st Century skills is also provided by Tony Wagner (. In essence, this basically relates to a set of cognitive skills and soft skills that allows individuals to flexibly and promptly react to difficult, unusual or critical situations that may occur in their life. In this context, there is also a need to talk about resilience and self efficacy (Gavora, 2008, pp. 222–235), which an individual needs to develop and cultivate from an early age.

"Despite the fact that the current rapidly changing society has – in terms of its requirements for a clear vision of direction and a pragmatic view on the economic and political attributes of their personality; the scholastic preparation of individuals – which would meet these declared needs, continues to stagnate. This conservative view on the preparation of students for life, which continues to be applied despite scientific knowledge in the fields of Cognitive Science and Education, can cause severe social and especially – educational problems" (Jůvová, et al., 2015).

Stakeholders – in terms of both education policy and education and the business environment are engaging this progressive and innovative stream of thought based on interdisciplinary and holistic perceptions of the individual and educational reality. Here, it is worth mentioning the OECD, or the Microsoft, CISCO, ISTE, Education 2020 concepts (viz Fig. 2).

Figure 2
Seven 21st Century Lifelong Skills



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A similar list of skills and abilities for the 21st. Century is also provided by the International Society for Technology in Education, and this with reference to Bloom's Taxonomy of Educational Goals and Constructivist Philosophy (Brichacek, 2014).

These basic skills and abilities place emphasis on innovation, cooperation, global citizenship and critical thinking. Six core technology standards for students are defined in the ISTE (2012) National Educational Technology Standards (NETS):

- Creativity and Innovation.
- Communication and Collaboration.
- Research and Information Fluency.
- Critical Thinking, Problem-solving and Decision-making.
- Digital Citizenship.
- Technology Operations and Concepts.

1.1 Constructivism and 21st Century Skills

The requirement for the development of 21st Century Skills in students corresponds to a change in approach to the learning process – which is focused on self-regulated learning and pedagogical changes in the interaction between teacher and pupil in favour of students' activities.

The principles of self-organized learning (together) with the perspective of lifelong learning that exploit the use of e-learning capabilities and ICT are governed by a subjective didactic model, which was created on the basis of the Constructivist-systemic Theory of Knowledge and an understanding of Neurophysiology and Psycho-neuroimmunology (Kohlberg, 2010; Wilhelm, 2012; and Kösel, 2001).

Access to Subjective Didactics is derived from a systems approach to the aims, contents, methods and means relating to changes in the role of teachers and the requirement associated with this to change the quality of social interactions between teachers and students (Jůvová, et al., 2015). According to Siebert (1999, p. 20), three basic concepts of the Constructivist Theory of the Learning Process can be distinguished:

1. Learning is the reflection of teaching and does not take into account the possibility of the self-determination of the individual of the surrounding environment.
2. Through their own activities, individuals master that reality which contributes most to cognitive openness and is based on a single representative model.
3. Learning is an autonomously regulated cognitive system that interacts with its' own states that differentiates and modifies the independence of its own structures. This is a radically Constructivist viewpoint, which can be complemented by the application phase of Socio-constructivist Theory.

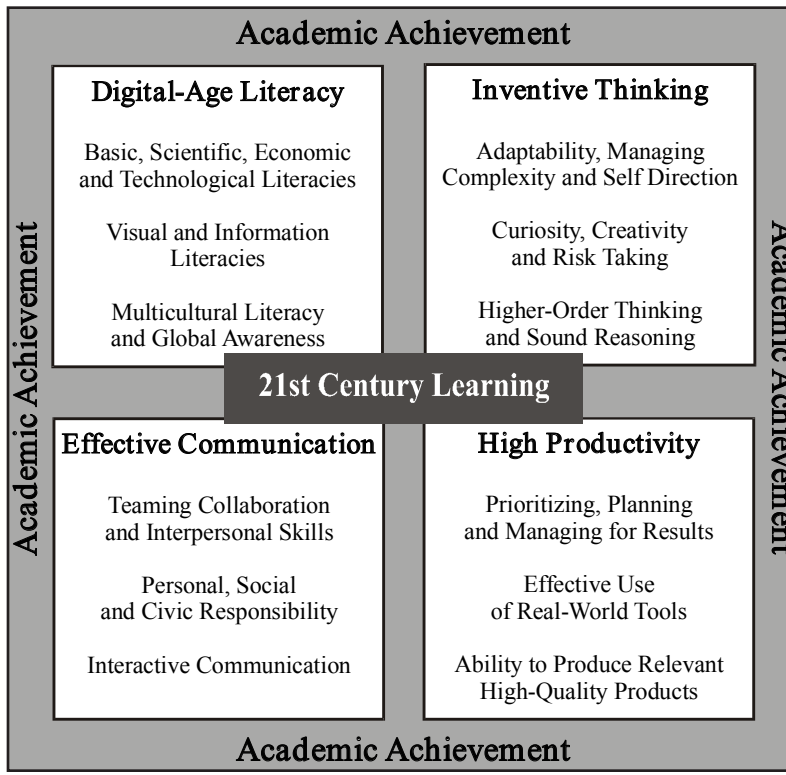
"Constructivism is a philosophy of learning founded on the premise that, by reflecting on our experiences, we construct our own understanding of the world we live in. Each

of us generates our own "rules" and "mental models," which we use to make sense of our experiences. Learning therefore, is simply the process of adjusting our mental models to accommodate new experiences" (Brooks, J. and M., 2011).

"Constructivists believe that, based on previous experience and knowledge, meaningful learning occurs when individuals construct their own meaning, rather than memorising answers and repeating "what I've learned". Therefore, one's own Constructivist curriculum is the refusal of a "one-size-fits-all" approach to learning and instead of this, the belief that the individual temselves'need the education" (Education 2020, 2015).

Five attributes of the Constructivist Concept of meaningful learning are mentioned by Jonassen, Peck and Wilson (1999, p. 15), and these are: Intentional Learning, Active Learning, Constructive Learning, Cooperative Learning, and Authentic Learning.

Figure 3
The frame of the 21st Century Learning



(Retrieved from: Digital Literacy. [online: http://digitalliteracy.us/21st-century-learning/])

2 Methodology and research aims

The selected research method was a Structured Content Analysis (Kerlinger, 1972; Mayring, 1993; Gavora, 2010). The aim was to determine the degree of implementation of 21st Century skills into the strategic documents defining educational and education curriculum in the Czech Republic.

A further aim was to analyse the relationships between selected categories and areas of 21st Century skills.

The materials under investigation are: The basic curricula document for Czech Primary Schools – The Education Framework for Basic Education (MŠMT, 2013), Core subjects of 21st Century skills listed in the P21 materials (http://www.p21.org/about-us/p21-framework); 21st Century Learning Design – Innovative Teaching and Learning Research; From Education Systems to the Learning Society (CISCO Systems, 2010).

Using Content Analysis method, we determined the following questions:
1. *How are these skills projected into the educational policy of the Czech Republic?*
2. *What is the concept of 21st Century skills in selected subjects?*

Selected categories and their relationships:
21st Century skills and pupils
21st Century skills and teachers
21st Century skills and educational interactions between teachers and pupils in education

2.1 Results

How are 21st Century skills projected into the educational policy of the Czech Republic?
In the current Educational Policy of the Czech Republic – 2020 Strategy document, emphasis is on the following essential features of contemporary education that correspond with 21st Century skills:
- Quality of education.
- Lifelong learning.
- Efficiency of learning processes – The Self-Learning Method.
- Information, communication and digital technology in teaching.

Teaching practice requirements: Mentoring, supervision, examples of good practice and support for further education of teachers (MŠMT, 2014).

The top-priority topics of the Educational Policy of the Czech Republic are:

- Open access to digital learning resources
- The development of pupils'/students' and teachers' digital competences
- The development of schools for digital education
- The support of development and innovation

Figure 4

Comparison of the core subjects included in P21 and the Czech Framework Plan:

Core subjects include – P21

- English, reading or language arts
- World languages
- Arts
- Mathematics
- Economics
- Science
- Geography
- History
- Government and Civics

Curriculum of the Czech Primary School

- Language and Communication (Czech Language and Literature, Foreign Language)
- Second Language
- Mathematics and its applications
- Information and Communication Technologies (ICT)
- People and the World
- People and Society (History, Civics)
- People and Nature (Physics, Chemistry, Biology, Geography)
- Art and Culture (Music, Art)
- People and Health (Health Education, Physical Education)
- The World of Work

Figure 5

A comparison of the Interdisciplinary themes of the P21 and Czech Framework plan:

Interdisciplinary themes – P21

- Global awareness,
- Financial, economic, business and entrepreneurial literacy,
- Civic literacy,
- Health literacy,
- Environmental literacy

Interdisciplinary themes – CZ

- Personal and Social Education
- Education for democratic citizenship
- Thinking in European and global context
- Multicultural Education
- Environmental Education
- Media Education

What is the perception of 21st Century skills for selected subjects?

Figure 6
A Comparison of the Component Skills of the Education 2020 and Skills from Education Systems to the Learning Society (CISCO Systems, 2010)

Seven Component 21st century skills (Education 2020)

- Critical Thinking & Problem-solving Research, Analysis, Synthesis, Project Management, etc.
- Creativity & Innovation, New Knowledge Creation, "Best Fit" Design Solutions, Artful Storytelling, etc.
- Collaboration, Teamwork & Leadership Cooperation, Compromise, Consensus, Community-building, etc.
- Cross-cultural Understanding across Diverse Ethnic, Knowledge & Organisational Cultures
- Communication & Media Fluency Crafting & Analysing Messages & Using Media Effectively
- Computing & ICT Fluency Effective Use of Electronic Information & Knowledge Tools
- Career & Learning – Self-reliance Managing Change, Lifelong Learning & Career Redefinition

Cognitive and non-socio-cognitive skills from Education Systems to the Learning Society (CISCO Systems, 2010)

Cognitive Skills

- Gathering, synthesising, and analysing information
- Working autonomously to a high standard with minimal supervision
- Leading other autonomous workers through influence
- Being creative and turning that creativity into action
- Thinking critically and asking the right questions
- Striving to understand others' perspectives and to understand the entirety of an issue
- Communicating effectively, often using technology
- Working ethically, firmly based in both your own society and the planet as a whole

Non-cognitive skills:

- Social Intelligence
- Emotional Resilience
- Enterprising Behaviour
- Inner Discipline

21st Century skills in relation to the Pupil category

In order to successfully develop 21st Century skills in pupils, emphasis is placed not only upon the development of Cognitive Abilities, but also upon so-called Soft Skills. In line with the intentions and principles of Pedagogical Constructivism, this has to with the following requirements (Cf. Brdička, 2003; Hejný, 2004; Molnár, Schubertová, Vaněk, 2007; Dostál, 2013; and Neumajer, 2014):

- An emphasis on activities and increased motivation of pupils to learn.
- A systems approach to problem-solving, seeking associations, association, an interdisciplinary transfers.
- Preserving the principles of linkage and relevance.

- The application of tuition methods according to the typology of the pupil (varying types of intelligence, personality, learning styles).
- An individual approach to pupils, based on their mental development.
- Two-way communication between teachers and pupils, teachers may learn from pupils
- Preparation for team-work – synergies.
- Activity-based learning, research-based learning.
- Communication and interaction with the pupil's family.
- Cooperation between subjects within and without the school, the community character of education.
- Working with mistakes and non-success.

21st Century skills in relation to the Teacher category

In the case of teachers, it is assumed that there are synergies with students' requirements, the ability of a teacher to self-educate themselves in the context of life-long learning, and to adequately and flexibly respond to social demands and changes brought about by the development of modern technologies.

In vocational training it is necessary to adapt to the paradigm shift in the teacher–pupil relationship and to accept the concept of self-managed learning in school practice.

Regarding teacher training, this has to do with opening up the tasks and perspectives that are reflected into the requirements for teacher personality characterised by the following fundamental phenomena:

- The development of soft skills.
- A perfect knowledge of course-content.
- Self-confidence, self-efficacy.
- A critical overview ability.
- Broadmindedness/Generosity and flexibility.
- A value-based orientation.

The basis for teachers' activities in the educational process is a comprehensive set of complementary teacher' activities that are founded on their professional competencies that are the sum of their theoretical knowledge and practical skills. Apart from these obvious educational activities, the interaction between teachers and pupils also reflects their personality and psychological traits, attitudes and the cultural capital that contribute to the teacher's individual perception and approach.

A teacher (who is) knowledgeable about the nature of the learning process that respects the student and who them holistically (in accordance with the bio-psychosocial concept of social personalities) and thereby reflects their personality and their performance. Only after extensive mastery of theory can they succeed in educational practice.

The premise of obtaining proper pedagogical qualification without prior thorough theoretical pedagogical psychological, personal and professional training is no longer sustainable. It is already too late for them to master this in practice. Teachers and novice teachers, are the bearers of progress rather than stagnation – and on the basis of their active research, they should contribute to predictions about the education sector (see Jůvová, et al. 2015).

21st century skills and the Teacher–Pupil relationship in education

In the interactions between teachers and pupils, this has to do with the meeting of two idiosyncratic individual systems, where first of all, it is necessary to achieve a common "tuning in" on the same wavelength – social and pedagogical consensus? Thus it follows:

- Motivation.
- Respect for the biological, psychological and social peculiarities of the pupil.
- Their readiness from the educational psychology perspective.
- Working with failure.

Conclusion

The requirement of lifelong learning – path is the goal:

- Personality preparation and pedagogical situation training in "protected environments".
- Crossing comfort zones.
- Transaction Analysis.
- The identification of pupils, teachers, school management, parents, and company needs.

Teachers must have sufficient professional competence and must have developed a comprehensive personal development program aimed at developing morality, sociability, character and respect for cultural and environmental values. Pupils, on the basis of the values and value-based relationships, create their own self-regulation system to all components of life that contribute to the quality of relationships in society.

The application methods of these ideas are reflected in teacher training colleges and the training of teachers in the Czech Republic – and especially, in the implementation of these requirements in pedagogical-psychological training subjects.

Even if, in our prognoses, one cannot precisely predict how technology will develop, nor how society will evolve, one must try to ensure that children in schools are prepared as best as possible for their future lives.

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Acknowledgement

The Article is dedicated to Project The VOICE of European TeacherS (VOICES), 526613-LLP-2012-NL-Comenius-CNW.

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